CLAIMS

Please amend the claims as follows:

1-7. (Cancelled)

8. (Previously Presented) A method for encoding motion within biological tissue comprising:

generating an imaging gradient to encode the harmonic or wave motion within the tissue by simultaneously encoding position and motion, the imaging gradient comprising a positive lobe and a negative lobe;

wherein the positive and negative lobes of the imaging gradient have non-symmetric amplitudes.

9-15. (Cancelled)

16. (Previously Presented) The method of claim 8, wherein the imaging gradient is a frequency encoding gradient, a phase encoding gradient or a slice selection gradient.

17. (Previously Presented) The method of claim 8, wherein the step of generating the imaging gradient is repeated with the sign of the imaging gradient inverted.

18. (Previously Presented) The method of claim 17, further comprising:

obtaining a first signal and a second signal each containing data indicative of sensed motion, the first signal based on the imaging gradient and the second signal based on the inverted imaging gradient; and

subtracting phase of the first signal from phase of the second signal to provide a total signal indicative of the sensed motion.

19. (Previously Presented) The method of claim 18, wherein the sensed motion is determined in each of multiple directions.

20. (Previously Presented) The method of claim 8, wherein the imaging gradient consists of a positive lobe and a negative lobe.

21. (Cancelled)

22. (Previously Presented) In a magnetic resonance elastography pulse sequence for encoding position and motion of spins in a specimen, an improvement comprising an imaging gradient comprising a positive lobe and a negative lobe, the positive and negative lobes of the imaging gradient having non-symmetric amplitudes.

23. (Previously Presented) The method of claim 8, wherein the harmonic or wave motion within the tissue is induced by repeatedly irradiating the target to be imaged with short pulses of high intensity microwave energy from at least one transmitting antenna.

24. (Previously Presented) The method of claim 23, further comprising detecting mechanical displacements associated with the harmonic or wave motion using a magnetic resonance (MR) scanner.

25. (Previously Presented) The method of claim 24, wherein the biological tissue comprises a human breast.

26. (Previously Presented) The method of claim 25, wherein the microwave energy is coupled into the biological tissue through a fluid comprising from seventy to ninety percent glycerin.

27. (Previously Presented) The method of claim 8, further comprising detecting mechanical displacements associated with the harmonic or wave motion using a magnetic resonance (MR) scanner.

28. (Previously Presented) The method of claim 24 wherein the step of detecting mechanical displacements comprises, for a plurality of selection gradients:

generating a first imaging gradient to simultaneously encode position and motion;

observing a first phase of magnetic resonance response of the target;

generating a second imaging gradient to simultaneously encode position and motion, the second imaging gradient inverted with respect to the first imaging gradient;

observing a second phase of magnetic resonance response of the target; and

subtracting the first and second phase of the magnetic resonance responses of the target to provide an indicator of mechanical displacements in the target.